CLAIMS

1. A satellite system comprising at least one satellite (4); at least one Earth station (6), and a plurality of user terminals (2).

the satellite (4) being arranged to provide a link between each user terminal (2) and the Earth station (6), via communications channels.

each channel comprising one or more timeslots in a repeating time frame on one or more frequencies. carried by a feeder link beam between said satellite (4) and the or each said Earth station (6), and one of a plurality of user terminal link beams (B1-BN) between the satellite (4) and the user terminals (2),

the satellite comprising a multiplexer (211) for multiplexing the channels from multiple said terminal link beams onto each said feeder link beam, and a demultiplexer (111) for demultiplexing the channels from onto each said feeder link beam onto multiple said terminal link beams;

and further comprising at least one router (112. 212) for assigning channels to and from particular said terminal link beams in response to control signals from said Earth station (6),

characterised in that the Earth station (6) is arranged to send, during a first said frame period. channel assignment signals relating to channel assignments in a following said frame period,

and in that the satellite (4) is arranged to control the router (112, 212) in accordance with said channel assignment signals in said following frame period.

2. A system according to claim 1, in which said following frame period is the next following frame period.

3. A system according to claim 2, in which the number of said slots in a said frame in the from-terminal direction is different to that in the to-terminal direction.

4. A system according to claim 3, in which the length of a said frame in the from-terminal direction is the same as that in the to-terminal direction.

5. A system according to claim 3 or claim 4, in which the bandwidth provided by each of said slots in a said frame in the from-terminal direction is the same as that in the to-terminal direction.

6. A system according to any of claims 3 to 5, in which there are more said timeslots in the to-terminal direction than in the from-terminal direction.

7. A system according to any preceding claim, in which the number of slots in a said frame is variable.

8. A system according to any preceding claim, in which the satellite (4) comprises means (211b) for time-demultiplexing said slots of each frame and said router (112, 212) is arranged to route slots of a single frame to different frequencies, or vice-versa, and to vary the routing of slots of a said frame on a said frequency.

9. A system according to claim 8 appended to claim 7, in which the length of the time-demultiplexer means (211b) is variable to accommodate said variable number of slots.

10. A satellite system comprising at least one satellite (4); at least one Earth station (6), and a plurality of user terminals (2),

the satellite (4) being arranged to provide a link between each user terminal (2) and the Earth station (6), via communications channels,

each channel comprising one or more timeslots in a repeating time frame on one or more frequencies, carried by a feeder link beam between said satellite (4) and the or each said Earth station (6), and one of a plurality of user terminal link beams (B1-BN) between the satellite (4) and the user terminals (2),

the satellite comprising a multiplexer (211) for multiplexing the channels from multiple said terminal link beams onto each said feeder link beam, and a demultiplexer (111) for demultiplexing the channels from onto each said feeder link beam onto multiple said terminal link beams;

and further comprising at least one router (112, 212) for assigning channels to and from particular said terminal link beams in response to control signals from said Earth station (6),

characterised in that there are more said timeslots in the to-terminal direction than in the from-terminal direction.

11. A satellite system comprising at least one satellite (4); at least one Earth station (6), and a plurality of user terminals (2),

the satellite (4) being arranged to provide a link between each user terminal (2) and the Earth station (6), via communications channels,

each channel comprising one or more timeslots in a repeating time frame on one or more frequencies, carried by a feeder link beam between said satellite (4) and the or each said Earth station (6), and one of a plurality of user terminal link beams (B1-BN) between the satellite (4) and the user terminals (2),

the satellite comprising a multiplexer (211) for multiplexing the channels from multiple said terminal link beams onto each said feeder link

beam, and a demultiplexer (111) for demultiplexing the channels from onto each said feeder link beam onto multiple said terminal link beams;

and further comprising at least one router (112, 212) for assigning channels to and from particular said terminal link beams in response to control signals from said Earth station (6),

characterised in that the number of slots in a said frame can be varied.

12. A system according to claim 11, in which said number can be varied independently for each said frequency channel.

13. A system according to any preceding claim, in which a single said beam is provided for each said user terminal (2).

14. A system according to any preceding claim, comprising a plurality of said satellites covering a region of the Earth.

15. A system according to claim 14, in which said satellites form a non-geostationary constellation.

16. A system according to claim 15, in which said constellation provides global coverage.

17. A system according to any of claims 14 to 16, in which the or each satellite (4) comprises means for applying a Doppler shift correction to each said beam.

18. A system according to any preceding claim, in which said user terminals (2) comprise handheld terminals.

19. Channel allocation apparatus for use in the system of any preceding claim.

20. Apparatus according to claim 19, said apparatus being provided at a said Earth station (6).

21. A satellite for use in the system of any of claims 1 to 20.

22. A user terminal for use in the system of any of claims 1 to 20.

23. A method of TDMA satellite communications with a user terminal, in which the satellite separately routes individual TDMA bursts of a given frequency channel and varies said routing from frame to frame.

24. A method of TDMA satellite communications with a user terminal, in which the number of said slots in a said frame in the from-terminal direction is different to that in the to-terminal direction.

25. A method according to claim 24, in which the bandwidth of said slots is the same in the from-terminal direction to that in the to-terminal direction.

26. A method according to claim 24, comprising varying the number of said slots allocated to a user terminal.

27. A method according to claim 24, comprising varying the number of said slots in a said TDMA frame.

28. A method according to claim 27, comprising varying the number of said slots in a said TDMA frame on a first frequency differently to that on a second frequency.